IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

ART+COM Innovationpool GmbH.,	)	
	)	
Plaintiff,	)	C.A. No. 14-cv-217-RGA
	)	
vs.	)	**DEMAND FOR JURY TRIAL**
	)	
GOOGLE INC.,	)	**FILED UNDER SEAL**
	)	
Defendant.	)	

NOTICE OF SUPPLEMENTAL INFORMATION
REGARDING CLAIM CONSTRUCTION

ACI hereby submits this Notice of Supplemental Information consisting of the two attached exhibits, which address issues relating to the parties' claim constructions. Exhibit A[1] is an excerpt of a summary judgment brief from prior litigation (the "Skyline Software Systems case") that was obtained through discovery from Defendant Google in this case after the claim construction briefing closed, and Exhibit B is an excerpt of a copy of a redacted declaration in support of that brief, which ACI obtained from PACER after receiving the brief in discovery.

Both the brief and the declaration address Google's views as to the meaning of the terminology used in the specification and claims of the '550 patent at issue in this litigation. In the Skyline Software case Google was relying on the '550 patent (prior to two reissues) as prior art against the Skyline Software patent at issue in that litigation. ACI respectfully submits that these exhibits are relevant to the construction of the terms "centrally storing the data for the field of view," "desired image resolution," "requesting data for the field of view from at least one of the plurality of spatially distributed data sources," and "space-related data." The brief and the

[1] Exhibit A was marked confidential—outside counsel only—by Google, and accordingly, while ACI does not believe it to be confidential, ACI has complied with Google's request and kept it confidential.

declaration support ACI's positions with respect to claim construction in this case. While only relevant portions of the brief and declaration are attached, ACI is prepared to submit the entire documents should the Court so desire.

Dated: May 5, 2015

Respectfully submitted,

FARNAN LLP

/s/ Brian E. Farnan

Joseph J. Farnan, Jr. (Bar No. 100245)
Brian E. Farnan (Bar No. 4089)
919 North Market St., 12th Floor
Wilmington, Delaware 19801
302-777-0321 Telephone
302-777-0301 Facsimile
farnan@farnanlaw.com
bfarnan@farnanlaw.com

Scott F. Partridge (admitted *pro hac vice)*
BAKER BOTTS L.L.P.
One Shell Plaza
910 Louisiana Street
Houston, TX 77002
713-229-1569
Scott.partridge@bakerbotts.com

Attorneys for Plaintiff ART+COM Innovationpool GmbH

EXHIBIT A

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MASSACHUSETTS

SKYLINE SOFTWARE SYSTEMS, INC., Plaintiff, v. KEYHOLE, INC., and GOOGLE INC. Defendants.	CIVIL ACTION NO. 06-10980 DPW

MEMORANDUM OF POINTS AND AUTHORITIES IN OPPOSITION TO PLAINTIFF SKYLINE SOFTWARE SYSTEMS, INC.'S MOTION FOR SUMMARY JUDGMENT OF VALIDITY OF THE PATENT-IN-SUIT

Nelson G. Apjohn (BBO No. 020373)
NUTTER McCLENNEN & FISH LLP
World Trade Center West
155 Seaport Boulevard
Boston, MA 02210
(617) 439-2000
Fax: (617) 310-9000

Attorneys for Defendants and Counterclaimants
KEYHOLE, INC. and GOOGLE INC.

Of Counsel
Darryl M. Woo, admitted *pro hac vice*
Michael J. Sacksteder, admitted *pro hac vice*
Heather N. Mewes, admitted *pro hac vice*
Carolyn Chang, admitted *pro hac vice*
Saundra L. M. Riley, admitted *pro hac vice*
FENWICK & WEST LLP
Embarcadero Center West
275 Battery Street
San Francisco, CA 94111
Tel. (415) 875-2300
Fax (415) 281-1350
email: dwoo@fenwick.com

TABLE OF CONTENTS

TABLE OF CONTENTS
(continued)

Page(s)

TABLE OF AUTHORITIES

Page

Cases

TABLE OF ABBREVIATIONS

Google	Defendants Keyhole, Inc. and Google, Inc.
Skyline	Plaintiff Skyline Software Systems, Inc.
'189 Patent	U.S. Patent No. 6,496,189.
Google Undisputed Facts	Separate Statement of Undisputed Material Facts in Support of Defendants' Motions for Summary Judgment of Noninfringement and Anticipation
Feiner SJ Decl	Declaration of Professor Steven K. Feiner, Ph.D., in Support of Defendants' Motions for Summary Judgment of Noninfringement and Anticipation
Chang Decl.	Declaration of Carolyn Chang in Support of Defendants' Motions for Summary Judgment of Noninfringement and Anticipation
Skyline Validity Mot.	Plaintiff Skyline Software Systems, Inc.'s Memorandum in support of its Motion for Summary Judgment of Validity of the Patent-in-Suit
Skyline Infringement Mot.	Plaintiff Skyline Software Systems, Inc.'s Memorandum in support of its Motion for Summary Judgment of Infringement
Haight Decl	Declaration of Geri L. Haight, Esq. in support of Plaintiff's Motions for Summary Judgment of Validity and Infringement
Feiner Opp. Decl.	Declaration of Professor Steven K. Feiner, Ph.D., in Support of Defendants' Opposition to Plaintiff Skyline Software Systems, Inc.'s Motions for Summary Judgment of Infringement and Validity
Mewes Decl.	Declaration of Heather N. Mewes in Support of Defendants' Opposition to Plaintiff Skyline Software Systems, Inc.'s Motions for Summary Judgment of Infringement and Validity
Feiner Depo.	Deposition of Steven K. Feiner, taken on January 11, 2006 (Haight Decl., Ex. 42; Mewes Decl., Ex. 7).
Lau Depo.	Depositions of Stephen Lau, taken on June 21, 2006 and June 22, 2006 (Chang Decl., Ex. 14; Haight Decl., Ex. 9; Mewes Decl., Ex. 6).

TABLE OF ABBREVIATIONS
(continued)

MAGIC	Multidimensional Applications and Gigabit Internet Consortium (MAGIC Final Report at GOOG 358) or Multidimensional Applications and Gigabit Internetwork Consortium (MAGIC IEEE Article at GOOG 347).
MAGIC Final Report	Yvan G. Leclerc, "MAGIC Final Report," SRI International, Menlo Park, CA (May 1996), available at http://www.ai.sri.com/~magic/magic-final-report.html (GOOG 000358-70) (Chang Decl., Ex. 21).
MAGIC IEEE Article	Barbara Fuller & Ira Richer, "The MAGIC Project: From Vision to Reality," *IEEE Network*, Vol. 10, No. 3, pp. 15-25 (May/June 1996) (GOOG 000346-25) (Chang Decl., Ex. 22)
TerraVision Tech Note	Y.G. Leclerc & S.Q. Lau, Jr., "TerraVision: A Terrain Visualization System," Technical Note 540, SRI International, Menlo Park, CA (April 22, 1994), available at http://www.ai.sri.com/~magic/terravision.ps.gz or http://www.ai.sri.com/pubs/files/778.pdf (GOOG 000371-390) (Chang Decl., Ex. 23).
TerraVision Video	TerraVision: A High Speed Terrain Visualization System (1994) and Architecture and Initial Performance of TerraVision (1994) (G-T_0018) (Chang Decl., Ex. 24). A transcript of the TerraVision Video was made during the deposition of Stephen Lau (Lau Depo. at 164:19-167:20, 171:6-174:24).
TerraVision Source Code	Source code for TerraVision (G-T_0020) (Chang Decl., Exs. 20 (excerpts), 34).
Clinger, GraphicsNet '95	Marke Clinger, "GraphicsNet '95: Integrated voice, video, graphics and data network using asynchronous transfer mode (ATM)," *ACM SIGGRAPH Computer Graphics*, 30(1), pp. 10-18 (Feb. 1996) (Chang Decl., Ex. 26).
Mayer or '897 patent	U.S. Pat. No. 6,100,897 (Haight Decl., Ex. 51)
T_Vision Project materials	SIGGRAPH '95 Multimedia CD-ROM, \COMUNITY\TVISION (G-T 0021) (Haight Decl., Ex. 30; Mewes Decl., Exs. 2-3).
Terra1995 Video	Video demonstration of T_Vision (G-T_0013) (Mewes Decl., Exs. 4-5)
Migdal or '783 patent	U.S. Pat. No. 5,760,783 (Haight Decl., Ex. 52).

TABLE OF ABBREVIATIONS
(continued)

Cosman Article	Michael Cosman, "Global Terrain Texture: Lowering the Cost," *Proceedings of the 1994 Image VII Conference*, Tempe, Arizona, The IMAGE Society, pp. 53-64 (GOOG 000334-45) (Haight Decl., Ex. 28).

with a smaller dataset does not mean they were incapable of writing source code that would download DEM tiles in the same way as OI tiles were downloaded. Feiner Opp. Decl. ¶¶ 67-68. Third, as indicated by the MAGIC Final Report and the MAGIC IEEE Article, the designers of the TerraVision application conceived of and disclosed systems that downloaded both OI and DEM tiles in the same manner as the claims of the '189 patent for use with larger datasets. Chang Decl., Ex. 21 at GOOG 362-64 & Ex. 22 at GOOG 350-51.

There is at minimum a genuine dispute of material fact as to whether the combination of the TerraVision prior art references would have rendered obvious claims 1 and 12, and, accordingly, Skyline's motion should be denied on this ground as well.

III. THE T_VISION PRIOR ART INVALIDIATES CLAIMS 1 AND 12

The T_Vision prior art provides additional grounds for denying Skyline's motion for summary judgment of validity. Skyline ignores numerous factual disputes precluding summary judgment, including disputes over the scope and content of the T_Vision prior art references, over differences between the claimed invention and the prior art, and over the level of ordinary skill in the art. *See, e.g., Medical Instrumentation*, 344 F.3d at 1221-22. Skyline also again conflates references, and picks and chooses some disclosures while ignoring others.

T_Vision was a method and device for the pictorial representation of space-related data, for example, geographical data of the earth. *See, e.g.*, Haight Decl., Ex. 51 ('897 patent at Abstract); Mewes Decl., Ex. 3 (SIGGRAPH '95 T_Vision Project, TVISION.HTL at p.1 ("T_Vision is an earth visualization project.")). There are at least three relevant T_Vision prior art references: (1) the Mayer patent, claiming priority from a German patent application filed in December 1995 (Haight Decl., Ex. 51); (2) the publication of materials describing the T_Vision Project on the SIGGRAPH '95 Multimedia CD-ROM in July 1995 (Mewes Decl., Ex. 2); and (3) the public use of T_Vision at SIGGRAPH '95 in August 1995. Feiner Opp. Decl. ¶¶ 71-107.

A. Skyline Mischaracterizes the Scope and Content of the Mayer Patent, the T_Vision Project Materials and the Public Use of the T_Vision Application

Skyline mischaracterizes the system described in the Mayer patent. As properly understood by a person of ordinary skill in the art, in at least one preferred embodiment shown in Figure 2, the Mayer patent discloses a remote server (primary node 1) and a client computer (tertiary node 3) connected via a communications link (interchange network 7):

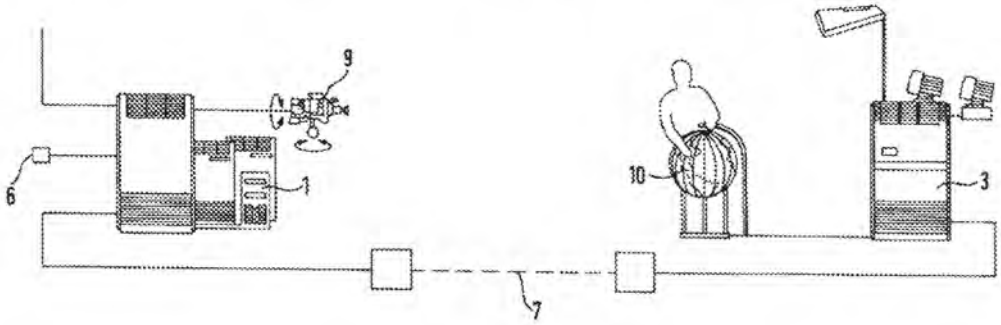
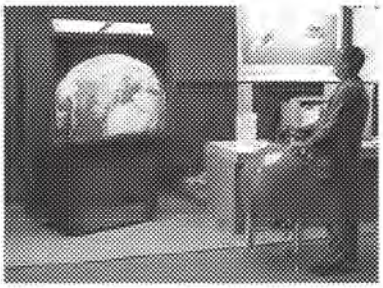


FIG. 2

Haight Decl., Ex. 51 ('897 patent at 2:51-56, 5:61-66, 6:12-21, 6:64-7:7, 7:42-54, 8:28-42 & Figs. 1-2); *see also* Feiner Decl. ¶¶ 85, 92, 95-97, 103-04. The node 3 client computer is also connected to an input medium 10 (the three-dimensional track ball in Figure 2, or a mouse) and a display. *Id.* The user manipulates the trackball to navigate the terrain and select a location and direction of view. *Id.* The client node 3 then uses data blocks provided from its "central storage" (i.e., local memory) to render the view and display it on a display unit 5 (or on the display of node 3). *Id.* If the data blocks provided from the local memory of node 3 are not at the indicated resolution level, then node 3 will download additional data blocks from the remote server node 1. *Id.* (node 3 not directly connected to collector network). The remote server node 1 obtains data blocks from spatially distributed data sources via a collector network 6 and sends them to the client node 3. *Id.* Skyline asserts that the trackball and display are "remote" from the client node 3, and then characterizes node 3 as a "remote server" and the display unit 5/input

medium 10 as a client computer. Skyline Validity Mot. at 11-12. However, Figure 2 shows that both the trackball and the display are connected directly to node 3 (and nothing else) and the Mayer patent simply refers to this as a "supply network." Haight Decl., Ex. 51 ('897 patent at 6:64-7:7 & Fig. 2); *see also* Feiner Opp. Decl. ¶¶ 96-97. At minimum, a person of ordinary skill in the art would also understand that the node 3 computer (an SGI Onyx in the preferred embodiment) would have its own display (regardless of whether it was also connected via the supply network to a display unit 5). *Id.* ¶ 97.

The disclosures in the SIGGRAPH '95 T_Vision Project materials show a similar set up to that described in Figure 2 of the Mayer patent:



Mewes Decl., Ex. 3 (PRESS.HTM at p.2) & Ex. 2 (TRACKER.mpeg). These materials also describe a remote database. *See, e.g., id.*, Ex. 3 (TERRABAS.HTM at p.2). This database was generated from spatially distributed data sources and, at the time of SIGGRAPH '95, included 10 GB of image and DEM data covering the whole world (with higher resolution data available for certain specific areas). *Id.* This data was downloaded and provided to a renderer for display. *Id.* (RENDERER at p. 1-2).

Skyline attempts to cast the T_Vision prior art references as "2D" systems. However,

Skyline does so by ignoring that the Mayer patent explicitly states that a "pictorial representation of space-related data" may be "based on a three-dimensional geometrical model." Haight Decl., Ex. 51 ('897 patent at col. 8:56-57). This patent also discloses that elevation data, as well as image data, is used for rendering certain pictorial representations: "In order to show the field of view with this image resolution a height value is required every 150 m and an image value of a surface every 15 m." *Id.* at col. 8:14-17. The Mayer patent also states that its methods can be used for representing topographical data, and refers to a "topographic grid network of the earth surface." *See, e.g., id.* at col. 1:7-10, 4:36-41 & 9:18-43. This is a grid representing elevation data (topography). Feiner Opp. Decl. ¶ 80. Skyline seizes on descriptions of this topographical grid network as "two-dimensional" to argue that the Mayer patent is not rendering three-dimensional terrain. However, this is simply a reference to how the data is stored (as a two-dimensional array), not a statement that the use of the topographical grid network results in the rendering of two-dimensional terrain. *Id.*

The T_Vision Project materials include disclosures that both elevation and image data was used to render three-dimensional terrain. These materials state that T_Vision provided a "virtual globe" that was "modeled from high resolution spatial data and textured with high resolution satellite images." Mewes Decl., Ex. 3 (TVISION.HTL at p.1). The "high resolution spatial data" is elevation data and it is "textured" or overlaid with "high resolution satellite images." Feiner Opp. Decl. ¶ 78. Moreover, these materials further clarify that both image data and elevation data were used to render the terrain: they describe a database with "pairs of index and data files containing 128x128 pixel texture images (surface, clouds) and 16x16 point elevation data." Mewes Decl., Ex. 3 (TERRABAS.HTM at p.1); *see also id.* ("Currently the source data consists of around 10 GB of image and DEM data…."). The videos included in

these materials also illustrate the rendering of three-dimensional terrain. *See* Mewes Decl., Ex. 2 (TERRA_S.mpeg & BERLIN.mpeg).

To counter these disclosures, Skyline resorts to misdirection. Skyline claims that the T_Vision Project materials state that "Geometry [*i.e.*, elevation] and Billboards [*i.e.*, vector data] are stored locally." *See* Skyline Validity Mot. at 13. The materials actually state: "The database basically consists of pairs of index and data files containing 128x128 pixel texture images (surface, clouds) *and 16x16 point elevation data*. Geometry and Billboards are not stored at other places in the current implementation, but this will change in the future." *See* Mewes Decl., Ex. 3 (TERRABAS at p. 1) (emphasis added). In context, it is clear that "geometry" does not refer to "elevation data" (which is contained in the database), but rather to other "geometry" data such as the CAD models of buildings. Feiner Opp. Decl. ¶ 101. Moreover, "other places" does not necessarily mean "locally." *See id.* The CAD building models and billboards were not obtained from spatially distributed data sources, but could be stored on the remote server. *Id.* In other words, Skylines points to nothing at all indicating that T_Vision failed to implement a remote, 3D visualization system.

Finally, Skyline tries to tear down the T_Vision Project materials as a "mere concept" despite the fact that the very same document describes "The (already existing and working) Prototype." *See* Mewes Decl., Ex. 3 (RENDERER.HTM at p. 1).[5] Skyline also carefully prunes its quotations to imply that the inventors of T_Vision wanted to "throw away all the code."

[5] There is no requirement that a printed publication have a working prototype to anticipate. *Schering Corp. v. Geneva Pharm., Inc.*, 339 F.3d 1373, 1380 (Fed. Cir. 2003) ("Anticipation does not require the actual creation or reduction to practice of the prior art subject matter; anticipation requires only an enabling disclosure."), *citing In re Donohue*, 766 F.2d 531, 533 (Fed. Cir. 1985) (finding it is not necessary that a product disclosed in a printed publication actually be made in order to establish that the publication constitutes an anticipation under 102(b)).

Skyline Validity Mot. at 13. The actual quotation makes clear that this was not the code for the renderer, but rather the code for the database: in the file "T_Vision Database" it states "One of the first things I will do is to throw away all the code I have written for *this* prototype and replace it with a real object oriented full feature *distributed high performance real time database.*" Mewes Decl., Ex. 3 (TERRABAS.HTM at p.3 (emphasis added)). In any case, this quotation confirms that T_Vision did have a working database—the developers just wanted to build a better one. Feiner Opp. Decl. ¶¶ 74-75.

Last, but not least, Skyline claims that the "Task" defined in the T_Vision Project materials of developing a database that utilizes geometry and textures in real time is "exactly what Skyline's Ronnie Yaron and Ofer Shor, (unlike TerraVision and T_Vision) undertook and solved." Skyline Validity Mot. at 13. Since the "Task" is the same, "The (already existing and working) Prototype" for T_Vision and descriptions of it anticipate claims 1 and 12. *See* Mewes Decl., Ex. 3 (RENDERER at pp. 1-2).

B. At a Minimum, There Is a Genuine Issue of Material Fact as to Whether the Mayer Patent, the T_Vision Project Materials and the Public Use of the T_Vision Application Anticipate Claims 1 and 12

1. *The Parties Dispute the Public Use of T_Vision at SIGGRAPH '95*

Skyline disputes that T_Vision was publicly demonstrated at SIGGRAPH '95, but such public use is corroborated by the publication of materials about the T_Vision Project from SIGGRAPH '95, and also by the testimony of Stephen Lau and Dr. Feiner. Mewes Decl., Ex. 2, Ex. 6 (Lau Depo at 44:20-47:25, 84:5-16, 202:12-205:12) & Ex. 7 (Feiner Depo at 45:11-52:6). Further evidence of what was demonstrated at SIGGRAPH '95 is found in the Terra1995 video describing T_Vision and in the Mayer patent (the corresponding German application was filed just a few months later in December 1995). Mewes Decl., Exs. 4 (Terra1995 video); Haight Decl., Ex. 51 ('897 patent); *see also* Feiner Opp. Decl. ¶ 73.

Skyline also again makes the baseless claim that Dr. Feiner's testimony is founded only on his personal observation of T_Vision at SIGGRAPH '95. Skyline Validity Mot. at 27-28. In fact, to the contrary, this testimony rests on Dr. Feiner's analysis of all the relevant evidence, not just his personal observations of an interactive demonstration of the T_Vision application at SIGGRAPH '95. Feiner Opp. Decl. ¶ 73.

It is clear from the very disclosures Skyline cites that the T_Vision application was more than a "mere concept." It was a working prototype with a functioning remote database. Mewes Decl., Ex. 3 (RENDERER.HTM & TERRABAS.HTM). There is nothing to indicate that the developers of T_Vision failed in any material way to implement the task of developing a renderer which visualizes a worldwide distributed database with unlimited geometry and textures in realtime. *See id.* The working prototype data base was more limited (covering 10 GB of image and DEM data over the whole world), but there is no 10 GB claim limitation in the '189 patent. *Id.*

Finally, whether or not the T_Vision application was publicly used has no import on the prior art status of either the Mayer patent or of the T_Vision Project material published in connection with SIGGRAPH '95.

2. *Under Skyline's View of the Court's Claim Construction, the Mayer Patent, the T_Vision Project Materials and the Public Use of the T_Vision Application Anticipate Claims 1 and 12*

Skyline asserts that none of the T_Vision references disclose the three functions of a "renderer" as construed by the Court. Skyline Validity Mot. at 29. It cites Dr. Feiner's testimony and argues that under the "proper" construction of the term renderer, Dr. Feiner cannot identify specific objects that are the renderer and not the renderer in T_Vision. However, under Skyline's loose interpretation of the term "renderer" (which does not require the identification of objects that are and are not the renderer and which also allows a single function to server as both

renderer and other object), it is not necessary to identify objects that are the renderer and objects that are not. *See* Google's Opp. to Skyline Infringement Mot. at 5-7. If this interpretation is followed, then there is at least a dispute of fact as to whether each of the T_Vision references discloses a renderer. *See* Feiner Opp. Decl. ¶¶ 82-85, 91-92, 95-97.

Skyline further claims that the T_Vision references did not disclose a "communication link" and a "processor," but this theory is based on Skyline's distorted view of the disclosures in the Mayer patent. Skyline Validity Mot. at 30. As shown in Figure 2, the "processor" is the processor of node 3. Haight Decl., Ex. 51 ('897 patent at Fig. 2); *see also* Feiner Opp. Decl. ¶¶ 85, 92, 95-97, 103-104. The "communication link" is the interchange network 7. *Id.* Moreover, node 3 also has a "central storage" which is the local memory of that machine. *Id.* In the Mayer patent, a "first data set" with coarse spatial resolution is called up and then "centrally stored" (becoming the "first data block from a local memory" at node 3). Haight Decl., Ex. 51 ('897 patent at col. 2:11-17); Feiner Opp. Decl. ¶ 95. The patent further states that "[a]fter each transmission and central storage of data, an image representation results, even if the data are insufficient to make possible the desired image resolution. As a result, even if the method is interrupted due to an alteration of the field of view and newly begun for a new field of view, the data for an image, even at low resolution, are always available." Haight Decl., Ex. 51 ('897 patent at col. 3:27-33).

Accordingly, at a minimum, there are genuine issues of material fact as to whether the Mayer patent, the T_Vision Project materials or the public use of the T_Vision application anticipate claims 1 and 12.

C. The Combination of the T-Vision Prior Art and the Knowledge of One of Ordinary Skill in the Art Renders Claims 1 and 12 Obvious

As detailed above there are at least genuine disputes of fact regarding the scope and

content of the T_Vision prior art. *See, supra*, Parts III.A & III.B. There are also genuine disputes of fact regarding the level of ordinary skill in the art to the extent that Skyline contends that any of these references are not enabling. Google also disputes the only alleged secondary consideration relied on by Skyline (failure of others)—the evidence shows that the developers of T_Vision *succeeded* in downloading image and elevation data in the manner claimed in the '189 patent (and Skyline at least appears to concede that they *succeeded* in downloading image data). Thus, again, on all four factual underpinnings of the obviousness inquiry, there are genuine disputes of material fact, and summary judgment should be denied. *See, e.g., Medical Instrumentation*, 344 F.3d at 1221-22.

There can be no real dispute that a person of ordinary skill in the art would have been motivated to combine the T_Vision application with the SIGGRAPH '95 T_Vision Project materials and with the Migdal patent. Feiner Opp. Decl. ¶¶ 105-106. This is not "impermissible hindsight." These references all refer to the same project and system. *Id.* ¶ 106.

In its motion, Skyline simply re-argues variants of the same issues already addressed above. It again advances its disputed interpretation of the Mayer patent as not having a client-server system, and argues under various theories that this does not satisfy the claims. Skyline Validity Mot. at 31-33, 35-36. Next, it asserts that the T_Vision references do not download elevation data (or that they are two-dimensional systems). *See id.* at 33-35. For the same reasons addressed above, these arguments should be rejected.

First, the T_Vision prior art references employed a system with a local memory and first data block as claimed by the '189 patent. This is the same argument Skyline raises above with the same result—the parties at a minimum dispute whether the node 3 computer is a "client" computer with a communications link to the node 1 "remote server" (Skyline asserts that the

"input" and the "display" are really the client computer and are remote from the node 3 computer). Haight Decl., Ex. 51 ('897 patent at col. 2:11-17, 3:27-33 & Fig. 2); *see also* Feiner Opp. Decl. ¶¶ 96-97. Moreover, Skyline ignores disclosures in the Mayer patent showing that client node 3 has only one display unit connected via the supply network, not a "plurality of displays," and that, in any case, a person of ordinary skill in the art would understand that node 3 has its own display. Haight Decl., Ex. 51 ('897 patent at col. 6:19-21 & Fig. 1); Feiner Opp. Decl. ¶ 97. Also, Dr. Feiner is not relying on "hindsight" to "perceive" a display in Figure 2 of the Mayer patent—it is right there in the figure. *Id.* at Fig. 2.

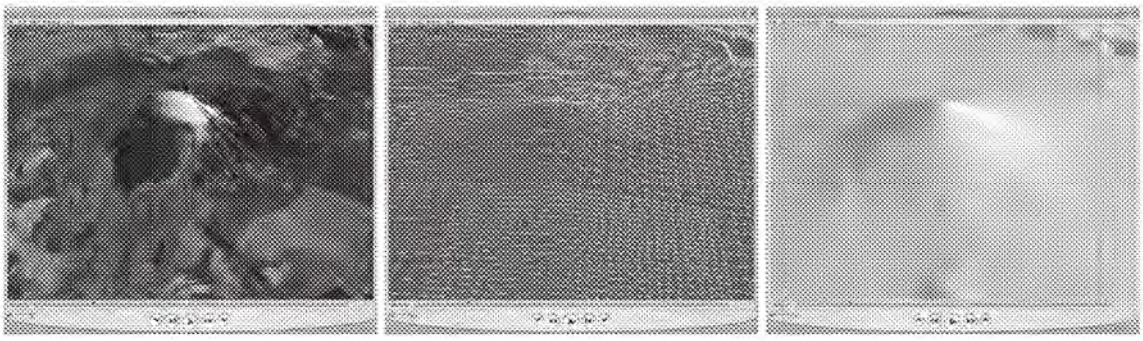
The T_Vision prior art references also disclosed the step of "receiving from the renderer" at least to the extent that the Court's construction of that term (and limitation) have been loosely interpreted by Skyline in its infringement motion. Skyline Validity Mot. at 35-36. As to this limitation, Skyline misstates Google's contentions. Google does not argue that the "GAI system" satisfies this limitation. A GAI or "address" simply identifies the location and resolution level of a data block (whether internally or externally). Haight Decl., Ex. 51 ('897 patent at col. 8:28-42 (discussing how sections are addressed in the quadrant tree)); *see also* Feiner Opp. Decl. ¶¶ 83-84. Google does not argue that the input device in the Mayer patent is the "renderer." The input device allows the user to navigate the terrain, not to perform the rendering functions recited of the '189 patent. Haight Decl., Ex. 51 ('897 patent at col. 7:3-9). The "renderer" in the Mayer patent is part of the node 3 computer, not part of the input medium or the display device. Feiner Opp. Decl. ¶¶ 96-97. The node 3 computer also is not the "remote server." *Id.* ¶ 97. In any event, Skyline's unfounded assumptions about Google's theories amount essentially to disputes of fact over the content of the prior art, and cannot provide a basis for summary judgment.

Finally, the T_Vision prior art references also disclosed a "processor" and a "communications" link as addressed above.

Second, the T_Vision prior art references further disclosed the remote, interactive streaming of 3D elevation data. As discussed above, there is clear and convincing evidence that all three T_Vision references disclosed the rendering of three-dimensional terrain using image data and elevation data (at least among other embodiments). *See, e.g.*, Haight Decl., Ex. 51 ('897 patent at Abstract, col. 1:7-10, 4:36-41, 8:14-17, 8:56-57, & 9:18-43); Mewes Decl., Ex. 3 (TVISION.HTL at p.1 & TERRABAS.HTM at p.1), Ex. 2 (TERRA_S.mpeg & BERLIN.mpeg). It is also clear that the T_Vision application rendered three-dimensional terrain:

> By switching the surface off, we can observe this process more easily. As the distance between us and the Earth increases, the high resolution data is removed from the memory and is replaced with new data for the wider field of view. Out of these different levels of altitude data, we compute the tectonic surface of the Earth and then project the corresponding satellite images onto it. An asynchronous and anticipatory loading strategy always guarantees a steady frames per second.

Mewes Decl., Exs. 4 (Terra1995 video) & 5 (transcript of video). In addition to the regular textured view, this portion of the Terra1995 video shows both wireframe and shaded, untextured views of the terrain that clearly indicate that it was rendered from a 3D model whose elevation varies across the terrain:



Further, in these T_Vision references, both image data and elevation data were

downloaded in the same manner as the '189 patent. *See* Feiner Opp. Decl. ¶¶ 99-104. The T_Vision Project materials describe the application as a "real-time rendering system," where remote data was "integrated unobtrusively into the user's system on the fly." Mewes Decl., Ex. 3 (TVISION.HTL at pp. 1, 2). It displayed a coarse view if you moved too fast, since it had to download additional, higher resolution data blocks in order to display the view at the requested resolution level. *Id.* (RENDERER.HTM at p. 1). The T_Vision Project materials also disclose that remotely stored data was accessed via NFS on an ATM-network. *Id.*, Ex. 3 (TERRABAS.HTM at p. 2); Feiner Opp. Decl. ¶ 102. Google certainly has not "admitted" that T_Vision never streamed elevation data as needed.

The Mayer patent also disclosed downloading additional, higher resolution data blocks in real-time as needed by the user. For example, the patent teaches:

> If the resolution of the representation is below the desired image resolution, the field of view is divided into sections and an investigation is undertaken for each individual section to see whether the data within the section are sufficient for a representation with the desired image resolution. If this is not the case for one of the sections, *further data with a finer resolution are called up*, transmitted and centrally stored from at least one of the spatially distributed data sources, and the section is shown with the new data. In turn an investigation is carried out into sufficient image resolution and possibly a further sub-division of the tested section is carried out into further partial sections as described above.

Haight Decl., Ex. 51 ('897 patent at col. 2:17-29); *see also id.* at col. 7:45-59. As with the T_Vision Project materials, there is nothing to indicate that elevation data was treated any differently than image data. Feiner Opp. Decl. ¶¶ 103-104.

To the extent that any one of these references lacked enabling disclosures, a person of ordinary skill in the art would have been motivated to combine them. *Id.* ¶ 106. The parties dispute whether these references were enabling either individually or as a combination. *Id.* ¶¶ 105-106. To bolster its enablement case, Skyline again improperly tries to build into this inquiry allegedly complex methods of "utilizing" the provided data blocks. Skyline Validity Motion at

34. These methods are not covered by the '189 patent. '189 patent, claims 1 and 12.

Finally, the T_Vision Project materials at SIGGRAPH '95 did not just identify a problem to be solved – these materials identified "The (already existing and working Prototype)" which solved that problem. Mewes Decl., Ex. 3 (RENDERER.HTM at p.1).

IV. THE MIGDAL AND COSMAN PRIOR ART INVALIDATES CLAIMS 1 AND 12

The combination of the Migdal patent and the Cosman article provides still another ground for denying Skyline's motion for summary judgment of validity. As detailed below, Skyline again ignores the numerous factual disputes precluding summary judgment, including disputes over the scope and content of this prior art, over differences between it and the claimed invention, and over the level of ordinary skill in the art. *See, e.g., Medical Instrumentation*, 344 F.3d at 1221-22. Moreover, while insisting that the Examiner of the '189 patent be given the greatest possible deference, Skyline apparently forgets that this same Examiner found that Migdal lacked only a single limitation of claims 1 and 12, a limitation explicitly found in the Cosman article.

The Migdal patent was filed on November 6, 1995, and issued on June 2, 1998. Haight Decl., Ex. 52. It describes a method and system for providing texture using a selected portion of a texture map. The Cosman article was presented at the IMAGE VII Conference in June 1994, and relates to global terrain texture. *Id.*, Ex. 28. These references are not "unrelated." Skyline Validity Mot. at 14. To the contrary, the Migdal patent specifically references the Cosman article as prior art, and given this express suggestion, a person of ordinary skill in the art would thus have been motivated to combine these references. *See id.*, Ex. 52 ('783 patent at References Cited); Feiner Opp. Decl. ¶¶ 113-114.

The Migdal patent is clearly relevant art as it was cited as prior art to the '189 patent. *See* '189 patent at References Cited. In fact, during prosecution of the '189 patent, the Examiner

EXHIBIT B

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MASSACHUSETTS

SKYLINE SOFTWARE SYSTEMS, INC., Plaintiff, v. KEYHOLE, INC., and GOOGLE INC. Defendants.	CIVIL ACTION NO. 06-10980 DPW

DECLARATION OF PROFESSOR STEVEN K. FEINER, Ph.D., IN SUPPORT OF DEFENDANTS' OPPOSITION TO PLAINTIFF SKYLINE SYSTEMS, INC.'S MOTIONS FOR SUMMARY JUDGMENT OF INFRINGEMENT AND VALIDITY

[PUBLIC REDACTED VERSION]

Nelson G. Apjohn (BBO No. 020373)
NUTTER McCLENNEN & FISH LLP
World Trade Center West
155 Seaport Boulevard
Boston, MA 02210
(617) 439-2000
Fax: (617) 310-9000

Attorneys for Defendants and Counterclaimants
KEYHOLE, INC. and GOOGLE INC.

Of Counsel
Darryl M. Woo, admitted *pro hac vice*
Michael J. Sacksteder, admitted *pro hac vice*
Heather N. Mewes, admitted *pro hac vice*
Carolyn Chang, admitted *pro hac vice*
Saundra L.M. Riley, admitted *pro hac vice*
FENWICK & WEST LLP
Embarcadero Center West
275 Battery Street
San Francisco, CA 94111
Tel. (415) 875-2300
Fax (415) 281-1350
email: dwoo@fenwick.com

I, Steven K. Feiner, declare as follows:

1. I make this declaration in support of Google's opposition to Skyline's Motions for Summary Judgment of Infringement and Validity. In this declaration, I provide my expert opinions concerning certain issues in this lawsuit relating to United States Patent No. 6,496,189 ("the '189 patent").

2. On January 19, 2007, I submitted a declaration in support of Google's Motions for Summary Judgment of Noninfringement and Validity ("Feiner SJ Decl."), wherein I addressed many of the issues raised by Skyline in its motions. Accordingly, I incorporate this declaration by reference.

3. My qualifications are stated more fully in my *curriculum vitae*, a true and correct copy of which was attached as Exhibit A to the Feiner SJ Decl.

4. I received a Ph.D. in Computer Science from Brown University in 1987. I received an A.B. degree in music from Brown University in 1973.

5. I am presently a Professor of Computer Science at Columbia University, a position that I have held for twenty years. I have been a Full Professor since January 2000. Prior to that, I was an Associate Professor of Computer Science at Columbia University from January 1991 until December 1999, and an Assistant Professor from September 1985 to December 1990. Prior to joining the faculty of Columbia University in September 1985, I was a Research and Teaching Assistant in the Department of Computer Science at Brown University from September 1977 until August 1985.

6. At Columbia University, I direct the Columbia University Computer Graphics and User Interfaces Laboratory, and teach both graduate and undergraduate students in computer graphics and user interfaces courses. I advise Computer Science doctoral candidates, primarily

in the field of computer graphics and user interfaces. I am an active academic researcher, whose areas of research include knowledge-based design of graphics and multimedia, user interfaces, virtual reality and augmented reality, wearable computing, animation, hypermedia, and visualization.

7. I am coauthor of *Computer Graphics: Principles and Practice, Second Edition,* Addison-Wesley, 1990 ("*Computer Graphics*"), an authoritative and frequently cited academic computer graphics text. I am also a coauthor of *Introduction to Computer Graphics*, Addison-Wesley, 1993, and *Computer Graphics: Principle and Practice, Second Edition in C,* Addison-Wesley, 1996. As indicated on my *curriculum vitae,* I am the author and coauthor of over thirty journal papers, over seventy conference papers, and numerous other workshop papers, books and book chapters, editorials and other publications on computer graphics and user interfaces. I have been an Associate Editor of *ACM Transactions on Graphics* and *ACM Transactions on Information Systems*, and have been on the editorial boards of *IEEE Transactions on Visualization and Computer Graphics*, and *Virtual Reality*. I am a frequent invited speaker on computer graphics and user interfaces at institutions such as Princeton University, the Massachusetts Institute of Technology, and Carnegie Mellon University. In addition, I have given invited talks at numerous conferences and workshops, including ones related to Geographic Information Systems ("GIS"), such as *GIScience 2002*, the Advanced Research and Development Activity *Geospatial Intelligence Information Visualization Researchers Meeting 2003* and *GIS Planet 2005*. In 1991, I received an Office of Naval Research Young Investigator Award.

8. I am a named inventor on an issued United States patent relating to computer graphics, entitled "Worlds-within-worlds nested display and interaction system and method"

(U.S. Pat. No. 5,524,187).

9. I have reviewed the '189 patent and its relevant prosecution history and am familiar with this patent, its claims, and the background technology.

10. The '189 patent uses concepts, nomenclature, designs, and systems from the computer graphics art that should be understood in this context. In my opinion, one of ordinary skill in the art relevant to the subject matter of the '189 patent at the time the application for the patent was filed would be a person with a bachelor's degree in Computer Science, including at least one course in computer graphics, or with academic or work experience equivalent to that level of education.

I. SKYLINE'S MOTION FOR SUMMARY JUDGMENT OF INFRINGEMENT

11. I understand that Skyline asserts in its motion for summary judgment of infringement that claims 1 and 12 of the '189 patent are infringed by the accused Google Earth products. My expert reports of August 10, 2006 and December 22, 2006 (Feiner SJ Decl., Exs. B and C, respectively) provide my opinions explaining fully why I disagree with this assertion. In addition, I submitted a declaration in support of Google's motions for summary judgment of noninfringement and invalidity ("Feiner SJ Decl.") which includes my opinions on why the Google Earth products do not infringe the asserted claims of the '189 patent, and which I incorporate herein by reference. In this declaration, I address some of the specific arguments raised by Skyline in its motion for summary judgment of infringement, and provide my expert opinion as to why certain limitations of claims 1 and 12 of the '189 patent are not met by the accused Google Earth products.

A. *All Asserted Claims: "receiving from the renderer one or more coordinates in the terrain along with indication of a respective resolution level"*

12. The Court construed a "renderer" as a "software and/or hardware object that

use a larger data set. *See, e.g.*, Chang Decl., Ex. 21 ("Thus, a user can roam over arbitrarily large databases without having to wait for the entire database to be downloaded first.").

T_VISION

70. T_Vision was a method and device for the pictorial representation of space-related data, for example, geographical data of the earth. *See, e.g.*, Haight Decl., Ex. 51 (U.S. Patent No. 6,100,897 at Abstract).

71. There are at least three relevant prior art T_Vision references: (1) the Mayer patent, claiming priority from a German patent application filed in December 1995 (*Id.*, Ex. 51); (2) the publication of materials describing the T_Vision Project on the SIGGRAPH '95 Multimedia CD-ROM in July 1995 (Mewes Decl., Exs.2 & 3; Haght Decl. Ex.30); and (3) the public use of T_Vision at SIGGRAPH '95.

72. In my opinion, the Mayer patent and the T_Vision Project materials on the SIGGRAPH '95 Multimedia CD-ROM anticipate at least claims 1 and 12 of the '189 patent, at least to the extent those claims can be read so broadly as to capture Google Earth. *See, e.g.*, Feiner SJ Decl., Ex. D at ¶¶ 113-131, 146-48, 159-68.

73. Furthermore, in my opinion, the public use of the T_Vision application at SIGGRAPH '95 also anticipates at least claims 1 and 12, at least to the extent those claims can be read so broadly as to capture Google Earth. *See id.* This opinion is not just based on my observation of T_Vision at SIGGRAPH '95, but is also based on the T_Vision Project materials, on the Mayer patent, on the Terra1995 a video illustrating T_Vision in operation, and on other documents corroborating the public use of T_Vision at SIGGRAPH '95. Haight Decl., Ex. 51; Mewes Decl., Exs. 2-4. In particular, the T_Vision project materials were distributed in connection with the public demonstration of the T_Vision application at SIGGRAPH '95 and

describe that system. The Mayer patent is based on a German patent application filed in December 1995, four months after SIGGRAPH '95 (held in August 1995). It names as inventors the same individuals identified in the T_Vision Project materials. It includes some of the same figures as the T_Vision Project materials. And the disclosures in the patent are consistent with the disclosures in the T_Vision Project materials (albeit, the patent provides much greater detail and also discloses alternative embodiments). The T_Vision video is dated 1995, the same year as SIGGRAPH '95, and also includes some of the very same footage about T_Vision included in the T_Vision SIGGRAPH '95 Project materials. Finally, the T_Vision demonstration I observed at SIGGRAPH '95 was not a video, but an interactive demonstration in which the system was used to explore the database in real time.

74. It is also clear that the T_Vision application was not a "mere concept" when it was demonstrated at SIGGRAPH '95. The T_Vision project materials clearly describe "The (already existing and working) Prototype." Mewes Decl. Ex. 3 (RENDERER.HTM at p. 1). A working prototype is more than a concept. These materials further describe the "Task" as developing "a renderer which visualize[s] a worldwide distributed database with unlimited geometry and textures in realtime." *Id.* After discussing the working prototype, the developers do identify some problems in completely fulfilling this "Task," but none have any relevance to the claims at issue. *Id.* at p. 2. In particular, there is no indication at all that the developers of T_Vision had any problem whatsoever in downloading or rendering elevation data. *Id.*

75. Moreover, the statement from one of the developers of T_Vision that he intended to "throw away all the code I have written for this prototype and replace it with a real object oriented full feature distributed high performance real time database" did not mean that T_Vision was just a concept. *See* Mewes Decl., Ex. 3 (TERRABAS.HTM at p. 3). As an initial matter,

this statement was made about the *database* alone, not the entire program. *See id*. But further, this shows that the developers of T_Vision did have a working prototype database. *Id.* (TERRABAS.HTM at pp. 1-2). That they thought they could build a better database does not mean that the working prototype database, let alone T_Vision, was merely a "concept."

76. Finally, in my opinion, the Mayer patent, the publication of the T_Vision Project materials, and the public use of the T_Vision application, either individually or in combination, at least render obvious claims 1 and 12 of the '189 patent. *See* Feiner SJ Decl., Ex. D at ¶¶ 113-131, 146-48, 159-68.

A. Anticipation

1. All Asserted Claims: "providing data blocks describing three-dimensional terrain"

77. The asserted claims recite a method of or apparatus for "providing data blocks describing three-dimensional terrain data." The Court has construed "data block describing three-dimensional terrain" to mean "a block or collection of data or digital information that represents or describes a section of three-dimensional terrain at a particular resolution level and that includes any additional data overlaid on the digital image of the terrain, such as altitude, labels or optional objects." Chang Decl., Ex. 4 at 9-12.

78. The T_Vision Project materials disclosed a "method of providing data blocks describing three-dimensional terrain to a renderer." These materials state that the T_Vision application provided a "virtual globe" that was "modeled from high resolution spatial data and textured with high resolution satellite images." Mewes Decl., Ex. 3 (TVISION.HTL at p. 1). The "high resolution spatial data" is elevation data and it is "textured" or overlaid with "high resolution satellite images." *Id.* Moreover, these materials further clarify that both image data and elevation data were used to render the terrain: they describe a database with "pairs of index

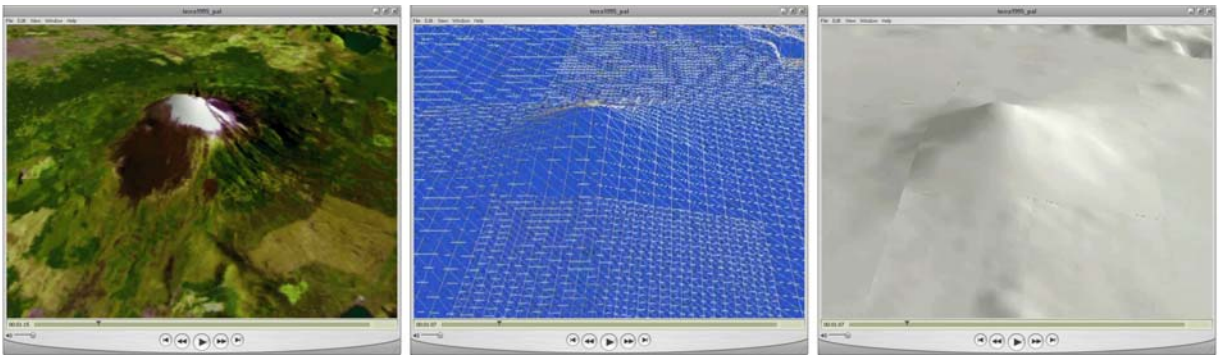
and data files containing 128x128 pixel texture images (surface, clouds) and 16x16 point elevation data." *Id.* (TERRABAS.HTM at p. 1); *see also id.* ("Currently the source data consists of around 10 GB of image and DEM data, covering the whole world in 4 km/pixel, USA and Europe in 1km, Japan in 50m, some areas in USA and Germany in 50m, and parts of Berlin and Tokyo down to 30cm."). The rendering of three-dimensional terrain is also illustrated in the T_Vision Project materials:

Mewes Decl., Ex. 3 (TVISION.HTL at p. 1); *see also id.*, Ex. 2 (TERRA_S.mpeg & BERLIN.mpeg).

79. That the T_Vision application publicly demonstrated at SIGGRAPH '95 rendered three-dimensional terrain data was also graphically demonstrated and described in the T_Vision Terra1995 video:

> By switching the surface off, we can observe this process more easily. As the distance between us and the Earth increases, the high resolution data is removed from the memory and is replaced with new data for the wider field of view. Out of these different levels of altitude data, we compute the tectonic surface of the Earth and then project the corresponding satellite images onto it. An asynchronous and anticipatory loading strategy always guarantees a steady frames per second.

Mewes Decl., Exs. 4-5. In addition to the regular textured view, this portion of the video shows both wireframe and shaded, untextured views of the terrain that clearly indicate that it was rendered from a 3D model whose elevation varies across the terrain:



80. The Mayer patent also disclosed a "method of providing data blocks describing three-dimensional terrain to a renderer." The patent is described as, "[a] method and device for the pictorial representation of space-related data, for example, geographical data of the earth." Haight Decl., Ex. 51 ('897 patent at Abstract). Moreover, the "representation" referred to may be "based on a three-dimensional geometrical model." *Id.* at col. 8:56-57. Furthermore, the Mayer patent specifically states that elevation data, as well as image data, is used for certain pictorial representations: "In order to show the field of view with this image resolution a height value is required every 150 m and an image value of a surface every 15 m." *Id.* at col. 8:14-17.

It also repeatedly refers to the visualization of topographic information, including the overlay of color data on a "topographical grid network of the earth surface." *See, e.g., id.* at col. 1:7-10 & 9:18-43. "In the topographical grid model the polygon grid imitates the topography of the surface" (and thus represents elevation data). *Id.* at col. 4:36-38. The topographical grid model is described as "two-dimensional," but this is a reference to how the data is stored (as a two-dimensional array of values), not to the type of data rendered. A person of ordinary skill in the art would recognize from these disclosures that the techniques disclosed in the Mayer patent were intended to be used to display three-dimensional terrain, in addition to other objects.

2. All Asserted Claims: "renderer"

81. The asserted claims further indicate that the "data blocks describing three-dimensional terrain" are provided to a "renderer." The Court has construed the "renderer" to be a "software and/or hardware object that performs at least the following functions: (1) determining and providing to another object the required coordinates in the terrain along with a respective resolution level; (2) receiving the data blocks corresponding to the specified coordinates; and (3) using the received data blocks to display a three-dimensional image." *Id.*, Ex. 4 at 26-32.

82. To the extent that Skyline seeks to interpret the term "renderer" more broadly than the Court's construction in an attempt to capture Google Earth, then in my opinion, the T_Vision Project materials, the T_Vision application and the Mayer patent also disclosed a "renderer."

83. The T_Vision Project materials describe data blocks with a Global Area Identifier corresponding to "coordinates in the terrain along with a respective resolution level." Mewes Decl., Ex. 3 (TERRABAS.HTM at pp. 1-2). Each "tile" or "patch" has "bounds generated by

binary subdivision of the whole coordinate system." *Id.* at p. 1. "The GAI can be seen as a kind of telephone number for reaching a particular sector of the planet. The number of digits corresponds to the level of detail; the higher the number, the finer the resolution." *Id.* This same system is disclosed in the Mayer patent. *Compare* Haight Decl., Ex. 51 ('897 patent at col. 8:28-67 & Figs. 4-6).

84. The T_Vision Project materials further state that "[t]he renderer computes the GAIs according to the field of view and makes a simple query." That is, it provides the coordinates in the terrain and an indicated resolution level to another object. Mewes Decl., Ex. 3 (TERRABAS.HTM at p. 2); *see also id.* (RENDERER.HTM at p. 1) ("Then it requests the data for a special location with an appropriate resolution."). The renderer also receives data blocks from local memory and renders these data blocks for view. *Id.* (RENDERER.HTM at pp. 1-2).

85. Likewise, the Mayer patent discloses a "node 3" which is the client computer (an SGI Onyx in the preferred embodiment). Part of this "node 3" computer provides the coordinates in the terrain and an indicated resolution level to another object. Haight Decl., Ex. 51 ('897 patent at col. 8:28-38). For geographically related data, "[t]he representation may in this case be carried out both according to cartographic points of view or also as a globe." *Id.* at col. 4:14-17. Moreover, "[i]f the node 3 then ascertains that the required screen resolution has not been achieved with the centrally stored data [i.e., the data in the local memory of node 3], it divides the field of view according to the model of the quadrant tree into four sections and checks each section to see whether, by representation of the data contained in the sections, the required image resolution has been achieved." *Id.* at col. 7:45-50; *see also id.* at col. 2:11-22 (first data set centrally stored and the field of view is shown) & col. 3:27-33 ("After each transmission and central storage of data, an image representation results, even if the data are

insufficient to make possible the desired image resolution. As a result, even if the method is interrupted due to an alteration in the field of view and newly begun for a new field of view, the data for an image, even at low resolution, are always available.").

3. *All Asserted Claims: "data blocks belonging to a hierarchical structure"*

86. The asserted claims further recite "data blocks belonging to a hierarchical structure which includes blocks at a plurality of different resolution levels." The Court has construed "data blocks belonging to a hierarchical structure" as "data blocks that are organized into multiple levels of resolution, whereby each level contains data blocks at the same resolution, and each successive level contains data blocks of a higher resolution than those in the preceding level." Chang Decl., Ex. 4 at 12-15.

87. The T_Vision application has "data blocks belonging to a hierarchical structure which includes blocks at a plurality of different resolution levels," as that phrase has been construed by the Court. As disclosed in the T_Vision Project materials, the T_Vision application used a "multi-layered database" that was "organized as a quadtree, containing higher levels of detail as you descend down the tree." Mewes Decl., Ex. 3 (RENDERER.HTM at p. 1). Levels of detail refer to resolution levels.

88. Likewise, the Mayer patent explains that the "sub-division of the image into sections with different spatial resolutions is preferably effected according to the method of a binary or quadrant tree." Haight Decl., Ex. 51 ('897 patent at Abstract). This is illustrated in Figures 4–6 of the Mayer patent, which show data blocks belonging to a hierarchical structure. *Id.* at Figs. 4–6. For example, as explained in the Mayer patent: "FIG. 6 shows a sub-division according to an octant tree for a representation based on a three-dimensional geometrical model. Here a section 14 o[f] a space is sub-divided into eight spatial sub-sections 15. By means of the

method according to the invention, consequently here also the data of just the spatial areas are called up in a higher accuracy, at which it is required in order to obtain the desired image resolution." *Id.* at col. 8:55-62.

89. At a minimum, these disclosures satisfy the "hierarchical structure" limitation as that limitation has been interpreted by Skyline in an attempt to capture Google Earth. Moreover, there is nothing in these disclosures indicating that anything but a strict hierarchy was used.

4. *All Asserted Claims: "receiving from the renderer one or more coordinates in the terrain along with indication of a respective resolution level"*

90. The Court has construed "coordinates in the terrain" as "a set of numerical values that identifies a particular location in the terrain," and "terrain" as "the surface features of an area of land, an object, or a material, including color, elevation, and existing objects or structures on the land, object or material." Chang Decl., Ex. 4 at 17-23. The Court has also clarified that "receiving from the renderer" means "something distinct from the renderer receiving from the renderer." *Id.*, Ex. 5 at 8-10.

91. As discussed above, the T_Vision Project materials expressly disclosed that "[t]he renderer computes the GAIs according to the field of view and makes a simple query." Mewes Decl., Ex. 3 (TERRABAS.HTM at p. 2). Thus, the "coordinates in the terrain along with indication of respective resolution level" (i.e., GAIs) are sent by the renderer, and (by implication), received by another object.

92. The Mayer patent states that part of the "node 3" computer requests "sections" of the field of view by providing coordinates along with an indication of a respective resolution level. As described in the Mayer patent: "Fig. 4 shows the formation of an address of a section using the model of a quadrant tree for sub-division of the field of view 11. In the first sub-division of the field of view 11 into four sections 12, these are identified clockwise with the

numerals 0 to 3. If a section is further sub-divided, the individual sub-sections 13 are numbered in the same way and the numbers thus obtained are prefixed to the numbers of the master section. With a permanently identical resolution of for example 128x128 points per section, the number of points of the section number is at the same time an indication of the level of spatial precision of the data." *Id.* ('897 patent at col. 8:28-38).

5. All Asserted Claims: "providing the renderer with a first data block which includes data corresponding to the one or more coordinates, from a local memory"

93. The Court has construed "first data block" as "the first data block provided to the renderer from the local memory corresponding to the specified coordinates." Chang Decl., Ex. 4 at 15-17. The Court has construed "local memory" as "memory easily accessible to the user's processor, either because it is physically part of the processor or is attached directly thereto, and distinct from the memory of the remote server from which data must be downloaded." *Id.* at 32-34. The Court has also clarified that "providing the renderer" means "something distinct from the renderer providing to the renderer." *Id.*, Ex. 5 at 8-10.

94. The T_Vision Project materials provide that the renderer "requests the data for a special location with an appropriate resolution…. If you approach too fast you will get a coarse image, but the frame rate is not affected." Mewes Decl., Ex. 3 (RENDERER.HTM at p. 1). A person of ordinary skill in the art would understand from this disclosure that the "coarse" image should be rendered from a first data block in local memory because the desired data block has not yet been downloaded. *See also id.* (TVISION.HTL at p. 2).

95. The Mayer patent states: "After each transmission and central storage of data, an image representation results, even if the data are insufficient to make possible the desired image resolution. As a result, even if the method is interrupted due to an alteration in the field of view and newly begun for a new field of view, the data for an image, even at low resolution, are

always available." Haight Decl., Ex. 51 ('897 patent at col. 3:27-33). The Mayer patent even refers to this coarse representation as a "first data set." *Id.* at col. 2:14-17.

96. Skyline asserts that the Mayer patent does not disclose a "local memory" that is easily accessible to the "processor." However, Figure 2 of the patent clearly shows a node 3 computer directly connected to an input medium (10) and at least one display:

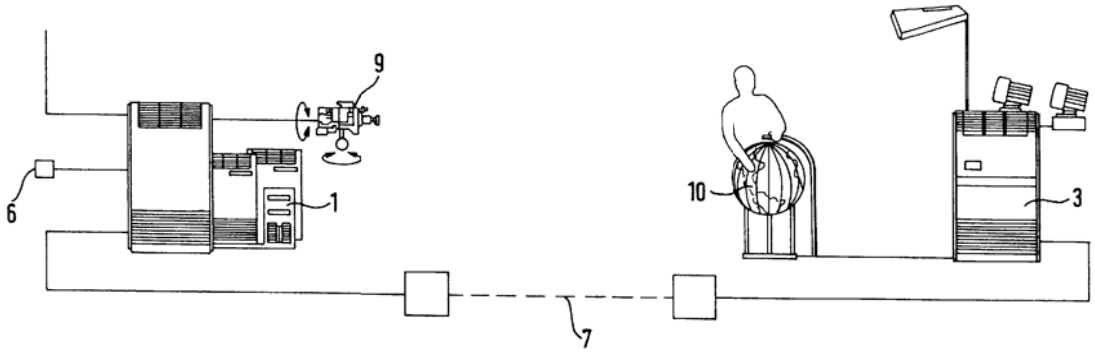


FIG. 2

See Haight Decl., Ex. 51 ('897 patent at col. 5:61-66, 6:64-7:1, 7:34-42 & Fig. 2). As shown in Figure 2, the user selects the field of view using a three-dimensional track ball (the input medium), connected to node 3. *See id.* at col. 7:3-7 & Fig. 2. Node 3 then determines if the data blocks needed to render that view are in its "central storage" (i.e., the local memory of node 3); if they are not, then node 3 calls up additional data blocks from the spatially distributed database (accessed through the collector network 6) via a remote server (node 1). *See, e.g., id.* at col. 3:27-33, 3:44-50, 7:45-59. A communications link (7) connects node 3 and node 1. *Id.*

97. The Mayer patent does disclose embodiments with one or more display units attached via a supply network 8. Skyline characterizes these display units as individual client computers. However, at least in the embodiment shown in Figure 2, it is clear that the user is not connecting to node 3 through some other computer—the three-dimensional track ball is directly connected to node 3, which is also shown as having a display. Indeed, this appears to be the

same set-up illustrated in the T_Vision Project materials:

Mewes Decl., Ex. 2 (TRACKER.mpeg (showing two displays, both with the same representation)). Thus, even assuming that the display units disclosed in the Mayer patent are separate computers, a person of ordinary skill in the art would have understood from this patent that the node 3 computer, with its central storage and processor, could be set up with its own display and directly connected to an input medium. In fact, the Mayer patent states that "systems of the company Silicon Graphics (SGI Onyx) were used as a node computer. This computer is capable of displaying more than 5,000,000 texturised triangles per second and consequently is suitable for rapid picture build-up." Haight Decl., Ex. 51 ('897 patent at col. 6:22-25). Moreover, Skyline's suggestion that the large track ball in Figure 2 is actually "remote" from node 3 is not accurate. The three-dimensional track ball—like the mouse on your computer—is simply an input medium.

6. All Asserted Claims: "downloading from a remote server one or more additional data blocks at a resolution level higher than the resolution level of the first data block which include data corresponding to the one or more coordinates if the provided block from the local memory is not at the indicated resolution level"

98. The Court has construed "downloading" to mean "requesting over a network from a separate computer and receiving on a local computer." Chang Decl., Ex. 5 at 4-8. The Court

has construed "downloading … if the provided data block from the local memory is not at the indicated resolution level" to mean "downloading … upon some determination that the block provided from local memory is not at the indicated resolution level." *Id.* at 10-12.

99. The T_Vision Project materials disclosed an application that downloaded additional, higher resolution data blocks as needed. This application was described as a "real-time rendering system" where remote data was "integrated unobtrusively into the user's system on the fly." Mewes Decl., Ex. 3 (TVISION.HTL at pp. 1-2). It displayed a coarse view if you moved too fast, since it had to download additional, higher resolution data blocks in order to display the view at the requested resolution level. *Id.* (RENDERER.HTM at p. 1).

100. There is nothing in these materials to indicate that only image data was downloaded. These materials explicitly state that the T_Vision database included data files with both image and elevation data, and accordingly, made clear that both types of data needed to be downloaded. *Id.* (TERRABAS.HTM at p. 1). As the only method disclosed for downloading data was to download it in "real-time" as needed by the user, a person of ordinary skill in the art would have understood that both image data and elevation data were downloaded in this manner.

101. The T_Vision Project materials include the following statement: "The database basically consists of pairs of index and data files containing 128x128 pixel texture images (surface, clouds) and 16x16 point elevation data. Geometry and Billboards are not stored at other places in the current implementation, but this will change in the future." I understand that Skyline asserts that this last sentence means elevation data was stored locally. This claim, however, is not supported. The prior sentence makes clear that the database already included elevation data: "The database basically consists of pairs of index and data files containing 128x128 pixel texture images (surface, clouds) *and 16x16 point elevation data*." *Id.* (emphasis

added). It was other "geometry" data (such as CAD models of buildings) and billboards that were "not stored at other places in the current implementation." *Id; see also id.* (RENDERER.HTM at p. 1 (database contains, "surface data (satellite imagery and aerial photographs), elevation data, transparent clouds, CAD-Models of buildings and Information billboards displaying names and current temperatures of selected cities")). Moreover, I disagree that this statement necessarily means even that the CAD models and billboards were stored locally. The T_Vision system establishes an ATM connection to "the server" that "provides the most up-to-date and highest resolution data required for the current field of view." *Id.* (TVISION.HTL). Thus, the CAD models and billboards may have been stored on this remote server instead of being collected from the spatially distributed data sources ("other places"). In that case, the geometry and billboards would still have needed to be downloaded to the client. Finally, even if one read this statement to mean that elevation data was stored locally, the T_Vision Project materials made clear that it could also be stored remotely and downloaded in real-time: "this will change in the future." *Id.* (TERRABAS.HTM at p. 1).

102. The T_Vision Project materials also disclosed that remotely stored data was accessed via NFS on an ATM-network. *Id*. at p. 2. Thus, regardless of whether or not the T_Vision application publicly demonstrated at SIGGRAPH '95 was connected to a network, these published materials disclosed a communications link. Moreover, there is also evidence indicating that the T_Vision application was connected to a network at SIGGRAPH '95, including testimony from Stephen Lau and documents showing that T_Vision had an ATM network connection set up at SIGGRAPH '95. *Id.*, Exs. 2, 6 (Lau Depo at 44:20-47:25, 84:5-16, 202:12-205:12) & 9 (Clinger Affidavit).

103. The Mayer patent also disclosed downloading additional, higher resolution data

blocks in real-time as needed by the user. For example, the patent states that "[i]f the resolution of the representation is below the desired image resolution, the field of view is divided into sections and an investigation is undertaken for each individual section to see whether the data within the section are sufficient for a representation with the desired image resolution. If this is not the case for one of the sections, *further data with a finer resolution are called up*, transmitted and centrally stored from at least one of the spatially distributed data sources, and the section is shown with the new data. In turn an investigation is carried out into sufficient image resolution and possibly a further sub-division of the tested section is carried out into further partial sections as described above." Haight Decl., Ex. 51 ('897 patent at col. 2:17-29); *see also id.* at col. 7:45-59. Moreover, as with the T_Vision Project materials, there is nothing to indicate that elevation data was treated any differently than image data.

104. The Mayer patent also explicitly states that a determination is made as to whether the block provided from local memory is not at the indicated resolution level before additional data blocks are downloaded—it tests whether the data within a section is sufficient for a representation with the desired image resolution. *See id.* If not, further data is downloaded. *Id.* Thus, the Mayer patent discloses a link between the condition of the provided block from local memory not being at the indicated resolution level and downloading additional data blocks. Moreover, "coarse" data blocks are downloaded first, and then progressively higher resolution data blocks are downloaded.

B. Obviousness

105. The Mayer patent, the T_Vision Project materials and the T_Vision application at minimum render obvious claims 1 and 12 of the '189 patent.

106. A person of ordinary skill in the art would have been motivated to combine the Mayer patent, the T_Vision Project materials and the T_Vision application, since all these references refer to the same project and system. Thus, to the extent that Skyline claims that the T_Vision Project materials or even the Mayer patent lacked necessary "detailed disclosures" regarding a "renderer" or a "hierarchical structure," these features were implemented in the T_Vision application, and thus were fully enabled.

107. Moreover, even assuming that elevation data was not downloaded in any of these references (though all of them indicate that it was), these references explicitly teach that elevation data, like image data, should be downloaded interactively in real time. Each of these references also includes sufficient disclosures that a person of ordinary skill in the art would have been enabled to download elevation data as well as image data—elevation data, like image data, is simply contained in data blocks, and the same processes can be used to download both types of data.

MIGDAL & COSMAN

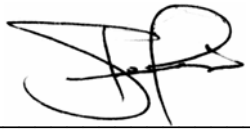
108. The Migdal patent was filed on November 6, 1995, and issued on June 2, 1998. Haight Decl., Ex. 52. It describes a method and system for providing texture using a selected portion of a texture map. The Cosman article was presented at the IMAGE VII Conference in June 1994, and relates to global terrain texture. *Id.*, Ex. 28.

109. The Migdal patent was cited by the Examiner during prosecution of the '189 patent. In particular, the Examiner described Migdal as "a system and method for modeling 3D objects," and found that it disclosed:

> [A] method of providing data blocks (LOD generation block 1050, FIG. 10), describing three-dimensional terrain to a renderer (raster subsystem 224, FIG. 2), the data blocks belonging to a hierarchical structure which includes blocks at a plurality of different resolution levels (col. 9, ll.5-17), the method comprising:

Michael Jones for its assertion that Migdal and Cosman do not render obvious claims 1 and 12. I have reviewed this evidence, and do not agree with Skyline's conclusions. In particular, Mr. Jones states that he did not perform an invalidity analysis or reach a definite opinion regarding whether Migdal or Cosman invalidates the claims of the '189 patent. Moreover, Mr. Jones does note that there is significant overlap between the prior art and the '189 patent.

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct. This declaration is executed this 2nd day of February, 2007, in Ballarat, Victoria, Australia.



Steven K. Feiner, Ph.D.

Certificate of Service

I hereby certify that, on February 2, 2007, I caused a true and accurate copy of the foregoing document to be served upon all counsel of record for each party by complying with this Court's Administrative Procedures for Electronic Case Filing.

By: /s/ Darryl M. Woo
Darryl M. Woo

CERTIFICATE OF SERVICE

I, Brian E. Farnan, hereby certify that on May 5, 2015, a copy of Notice of Supplemental Information Regarding Claim Construction was served as indicated on the following:

Via E-Mail
Jack B. Blumenfeld
Morris, Nichols, Arsht & Tunnell LLP
1201 North Market Street
P.O. Box 1347
Wilmington, DE 19899
jblumenfeld@mnat.com

Attorneys for Defendant

Via E-Mail
Cono A. Carrano
David C. Vondle
Ashraf A. Fawzy
Akin Gump Strauss Hauer & Feld LLP
ccarrano@akingump.com
dvondle@akingump.com
afawzy@akingump.com

Attorneys for Defendant

/s/Brian E. Farnan
Brian E. Farnan (Bar No. 4089)